

METTLER TOLEDO APPLICATION NOTE

Magnesium Oxide Slurry Control

BACKGROUND

The recovery of cooking liquor chemicals in pulp manufacture results in both a reduction of environmental loads and lower operational costs. Chemical recovery plants work on the basis of a wet process during which the SO₂ and MgO contained in the flue gas from the recovery boiler are converted into magnesium bisulfite.

THE PROCESS

There are several stages to achieve this, one of which is SO₂ absorption. In the wet process, ash separation and flue gas saturation occur together in a wet scrubber. Absorbent preparation begins with the suspension of the separated ash. The magnesium oxide reacts with water to form magnesium hydroxide and serves as an SO₂ absorbent. In the alkaline sulfite stages, crystalline magnesium sulfite is formed which is converted into magnesium bisulfite through further contact with SO₂. This results in raw acid which is drawn off and passed on for acid preparation. After clarification, insoluble impurities can be discharged by means of sedimentation. With further fortification, cooking acid is produced for reuse in the process.

INSTRUMENTATION

In order to obtain a reliable in-line pH signal for use as a control parameter for the recovery of chemicals in the spent pulp liquor, proper electrode and housing selection is critical. Problems of this process include product characteristics, requirements for acid flushing, temperature range and reliability of the measurement. Due to these conditions the METTLER-TOLEDO Xerolyt[®] electrode (HA405-DXK) is recommended, in conjunction with the InTrac[®] 777-SL retractable housing.

This rugged electrode features our patented Xerolyt solid polymer reference which features dual open apertures instead of the conventional ceramic junction, allowing the electrolyte and medium to be in direct contact. These apertures are much less likely to become clogged than the fine pores of a ceramic diaphragm, making Xerolyt particularly suitable for heavily contaminated or sulfide-containing media and solutions with a high concentration of suspended solids.

The Xerolyt pH electrode should be installed in an InTrac 777-SL retractable housing which allows users to remove the electrode from the process without process interruption. The retractable feature permits routine electrode maintenance throughout the process to further extend the electrode life. In particularly harsh processes, users may also use the automatic (pneumatic) housing version to set timed insertion/retraction intervals to limit sensor contact with the process which may also extend sensor life. Additional safety features include position indicator and interlock which prevent misuse of the retractable housing, making it a safe, practical housing for magnesium oxide slurry control.

This system is compatible with the 2100 pH analyzer.

PRODUCTS

2100 pH Analyzer

- Detachable front panel and plug-in terminals for ease of installation
- All functions accessible through the keypad for increased ease of use
- Continuous sensor and transmitter diagnostics to monitor performance
- FM certification for Class I, Div 1 & 2 Environments and CSA General Purpose Approval
- 3 year warranty

Xerolyt[®] DXK pH Electrode

- Patented Xerolyt solid polymer reference system maintains a stable potential for accurate and repeatable pH measurement and low maintenance
- Open junctions eliminate reference clogging and extend sensor life
- High pressure resistance eliminates requirement for pressurizable housing
- Xerolyt solid polymer is particularly suitable for use in emulsions, suspensions, heavily contaminated or sulfide-containing media, and solutions with high concentration of suspended solids

InTrac[®] 777-SL Retractable Housing

- Rugged 316L SS or PVDF construction for maximum chemical resistance
- Flushing chamber for automatic cleaning and calibration reduces overall system downtime
- Patented immersion tube design isolates the sensor on retraction and guarantees complete separation of the process from the outside environment.
- Safety interlocks prevent sensor removal from housing while in measuring position
- Manual or pneumatic operation